

WHAT IS CLAIMED IS:

1. An image forming apparatus, comprising:

a mainframe;

a photoreceptor;

5 an exposing unit that exposes a surface of the photoreceptor to form an electrostatic latent image; and

a developing unit that develops the electrostatic latent image by supplying a charged developer on the surface of the photoreceptor having the electrostatic latent image formed  
10 thereon;

wherein the photoreceptor is loadable in and unloadable from the mainframe separately from the developing unit.

2. The image forming apparatus as claimed in claim 1, further  
15 comprising:

a photoreceptor cartridge that retains the photoreceptor and is loadable in and unloadable from the mainframe while being separated from the developing unit.

20 3. The image forming apparatus as claimed in claim 2, wherein the photoreceptor includes a plurality of photoreceptors for a plurality of colors; and

the photoreceptor cartridge integrally retains the plurality of photoreceptors.

4. The image forming apparatus as claimed in claim 2,  
wherein the photoreceptor cartridge is loadable in and  
unloadable from the mainframe in a direction being substantially  
in parallel to a conveying direction of a transfer medium, to  
5 which the developer is transferred from the photoreceptor.

5. The image forming apparatus as claimed in claim 2,  
wherein the photoreceptor cartridge includes a charger  
that uniformly charges the surface of the photoreceptor prior  
10 to formation of the electrostatic latent image.

6. The image forming apparatus as claimed in claim 2,  
wherein the mainframe includes a guide part that guides  
movement of the photoreceptor cartridge at the time of loading  
15 and unloading; and  
the photoreceptor cartridge includes a guided part guided  
by the guide part.

7. The image forming apparatus as claimed in claim 2,  
20 wherein the developing unit is loadable in and unloadable  
from the mainframe in a direction that crosses a conveying  
direction of a transfer medium to which the developer is  
transferred from the photoreceptor and that is perpendicular  
to a longitudinal direction of the photoreceptor.

8. The image forming apparatus as claimed in claim 7, further comprising: an evacuating unit that evacuates the developing unit in a direction away from the photoreceptor cartridge at the time of loading and unloading.

5 9. The image forming apparatus as claimed in claim 3, wherein the plurality of photoreceptors includes a photoreceptor corresponding to black color and being exchangeable separately from the other photoreceptors.

10 10. The image forming apparatus as claimed in claim 1, wherein the developing unit is loadable in and unloadable from the main frame in a direction different from the direction in which the photoreceptor is loaded and unloaded.

15 11. The image forming apparatus as claimed in claim 10, wherein the developing unit is loadable in and unloadable from the main frame in a direction substantially opposite to the direction in which the photoreceptor is loaded and unloaded.

20 12. The image forming apparatus as claimed in claim 10, further comprising:

a first openable member provided on the main frame; and

a transfer unit that transfers a developer image carried on the photoreceptor onto a transfer medium and that is supported by the first openable member;

wherein the mainframe has a first opening that is opened  
5 and closed with the first openable member; and

the photoreceptor is loadable in and unloadable from the mainframe through the first opening.

13. The image forming apparatus as claimed in claim 12,  
10 wherein the photoreceptor faces the transfer unit at a transferring position;

the exposing unit is disposed on a side of the photoreceptor opposite to the transferring position; and

the exposing unit overlaps with the photoreceptor in a  
15 substantially horizontal direction.

14. The image forming apparatus as claimed in claim 13, wherein the exposing unit includes a laser scanner.

20 15. The image forming apparatus as claimed in claim 14, wherein the developing unit includes a plurality of developing units;

the laser scanner includes a plurality of laser scanners each having a casing;

the developing units and the laser scanners are arranged alternately with each other in a substantially vertical direction; and

the developing units are loadable in and unloadable from  
5 the mainframe along surfaces of the casings of the laser scanners.

16. The image forming apparatus as claimed in claim 15,  
wherein the mainframe includes a guide member that guides  
10 the developing unit being loaded therein and unloaded therefrom;  
and

the developing unit includes an engaging part that engages  
with the guide member.

15 17. The image forming apparatus as claimed in claim 13,  
wherein the exposing unit includes an LED array.

18. The image forming apparatus as claimed in claim 10,  
wherein the mainframe includes an operating part;  
20 the mainframe is provided with a second openable member  
on a side on which the operating part is disposed;

the mainframe includes a second opening that is opened  
and closed with the second openable member; and

the developing unit is loadable in and unloadable from  
25 the mainframe through the second opening.

19. The image forming apparatus as claimed in claim 12,  
wherein the developing unit includes a developer carrying  
member that carries a developer; and

5 the developer remaining on the photoreceptor after the  
transfer unit transferring the developer image onto the transfer  
medium is recovered by the developer carrying member.

20. The image forming apparatus as claimed in claim 1,  
10 wherein the developing unit and the photoreceptor are  
independently loadable in and unloadable from the mainframe.

21. The image forming apparatus as claimed in claim 20,  
wherein the developing unit and the photoreceptor are  
15 loadable in and unloadable from the same side of the mainframe.

22. The image forming apparatus as claimed in claim 20,  
wherein the developing unit includes a plurality of  
developer carrying members that carry the developer;

20 the photoreceptor includes a plurality of photoreceptors;  
the photoreceptors are loadable in and unloadable from  
the mainframe in a predetermined direction; and

the photoreceptors and the developer carrying members  
are arranged alternately with each other in a direction  
25 perpendicular to the predetermined direction.

23. The image forming apparatus as claimed in claim 20, further comprising:

a first openable member provided on the mainframe; and  
5 a transfer unit that transfers an developer image carried on the photoreceptor onto a transfer medium and is supported by the first openable member;

wherein the mainframe has a first opening that is opened and closed with the first openable member; and

10 the photoreceptor is loadable in and unloadable from the mainframe through the first opening.

24. The image forming apparatus as claimed in claim 23,

wherein the photoreceptor faces the transfer unit at a  
15 transferring position;

the exposing unit is disposed on a side of the photoreceptor opposite to the transferring position; and

the exposing unit overlaps with the photoreceptor in a substantially horizontal direction.

20 25. The image forming apparatus as claimed in claim 24,

wherein the exposing unit includes an LED array.

26. The image forming apparatus as claimed in claim 23,

wherein the developing unit includes a plurality of developer carrying members;

the photoreceptor includes a plurality of photoreceptors;  
and

5 the developer carrying members and the photoreceptors are alternately arranged in a conveying direction of the transfer medium.

27. The image forming apparatus as claimed in claim 23,  
10 wherein the developing unit includes a developer carrying member;

the photoreceptor includes a photoreceptor drum;  
the photoreceptor drum opposes to the developer carrying member at a developing position;

15 the photoreceptor drum opposes to the transfer medium at a transfer position; and

a line passing through a rotation center of the photoreceptor drum and the developing position is substantially perpendicular to a line passing through the rotation center  
20 of the photoreceptor drum and the transferring position.

28. The image forming apparatus as claimed in claim 20,  
wherein the developing unit includes a first grab handle;  
and



the photoreceptor is accommodated in a photoreceptor unit having a second grab handle.

29. The image forming apparatus as claimed in claim 28,  
5 wherein the developing unit includes a developer carrying member;

the first grab handle is provided on the developing unit at both ends in an axial direction of the developer carrying member; and

10 the second grab handle is provided on the photoreceptor unit at both ends in an axial direction of the photoreceptor.

30. The image forming apparatus as claimed in claim 21,  
wherein the photoreceptor is accommodated in a  
15 photoreceptor unit loadable in and unloadable from the mainframe;

the mainframe includes a guide part that guides the photoreceptor unit being loaded therein and unloaded therefrom;

the photoreceptor includes an engaging part that engages  
20 with the guide part; and

the guide part includes a positioning member that positions the photoreceptor unit at a deepest part thereof.

31. The image forming apparatus as claimed in claim 30,

wherein the developing unit includes a developer carrying member; and

the mainframe includes an urging part that urges the photoreceptor unit positioned by the positioning member to the developer carrying member.

32. The image forming apparatus as claimed in claim 20, wherein the developing unit includes a developer carrying member that carries a developer; and

the developer remaining on the photoreceptor after the transfer unit transferring the developer image onto the transfer medium is recovered by the developer carrying member.

33. A photoreceptor cartridge to be loaded in an image forming apparatus, wherein the image forming apparatus includes a developing unit that develops an electrostatic latent image by supplying a charged developer, the photoreceptor cartridge comprising:

a photoreceptor having a surface on which the electrostatic latent image is formed to be developed by the developing unit;

wherein the photoreceptor cartridge is loadable in and unloadable from a mainframe of the image forming apparatus while being separated from the developing unit.

34. The photoreceptor cartridge as claimed in claim 33,  
wherein the photoreceptor includes a plurality of  
photoreceptors for a plurality of colors, which are integrally  
retained.

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35. The photoreceptor cartridge as claimed in claim 34,  
wherein the photoreceptor cartridge is loadable in and  
unloadable from the mainframe in a direction being substantially  
in parallel with an aligning direction of the plurality of  
10 photoreceptors.

36. The photoreceptor cartridge as claimed in claim 33,  
further comprising:

15 a charger that uniformly charges the surface of the  
photoreceptor prior to formation of the electrostatic latent  
image.

37. The photoreceptor cartridge as claimed in claim 33,  
wherein the photoreceptor includes a guided part that  
20 is guidable by a guide part formed in the mainframe when the  
photoreceptor is loaded in or unloaded from the mainframe.

38. The photoreceptor cartridge as claimed in claim 34,

wherein the plurality of photoreceptors includes a photoreceptor corresponding to black color and being exchangeable separately from the other photoreceptors.

5 39. The photoreceptor cartridge as claimed in claim 33, further comprising: a cover member that covers exterior of the photoreceptor cartridge;

wherein the cover member is detachable so that the photoreceptor cartridge is loadable in the mainframe without  
10 the cover member.